

Executive Summary of Report of Neuroscience Departments & Programs Survey Academic Year 2016–2017

The most recent survey of neuroscience training programs was launched in 2016 by the Society for Neuroscience (SfN) as a major redesign of the survey that has been conducted since 1986, first by the Association of Neuroscience Departments and Programs and subsequently by SfN. These surveys have previously focused on the evolution of neuroscience departments and doctoral programs by tracking several important dimensions, including program characteristics and the number and demographics of faculty and students. This year, the survey was expanded to include undergraduate programs and more international programs.

A large quantity of information is available from this survey, which included responses for 120 programs; a full report of this survey can be found at [this link](#). Below are key findings from the survey data, which are based on the 2016–2017 Academic Year.

US Doctoral Program Characteristics

- Doctoral training programs in neuroscience or a neuroscience-related discipline exist in various administrative structures and sizes.
- Most doctoral programs are interdepartmental or are housed in a graduate school; only 12% of programs are housed specifically in a department of neuroscience.
- The vast majority of neuroscience doctoral programs have existed for more than 10 years, with only a few arising in the last 5 years.
- Approximately two-thirds of the doctoral programs include an MD/PhD training component.

US Doctoral Program Faculty

- The number of faculty members per program varies widely, with some programs having fewer than 10 faculty members and others having more than 100.
- On average, the faculty size is 66 per program, which reflects an increase from the most recent survey, conducted 5 years ago (Academic Year 2010–2011), and a general shift of the distribution toward more faculty.
- On average, 93% of the faculty in these programs have positions in the tenure stream.
- Women represented 30% of tenure-stream faculty in doctoral graduate programs, a number that has changed little during the past decade.
- Approximately 10% of tenure stream faculty were underrepresented minorities, a number that has changed little over the past decade.

Admission Into US Doctoral Programs

- The number of applicants, students accepted, and students matriculated varies markedly across programs; for example, among the responding programs, the number of applicants ranged from 5 to more than 500, with an average of 170 and a median of 94.
- The number of applicants per program has increased from the 2011 survey, with the median number of applicants increasing by approximately 35%. Most programs note that they have seen an increase in number of applicants greater than 10% over the past 5 years.

- On average, programs accepted 19% of their applicants and matriculated 52% of those accepted. On average, programs matriculated 10 students in 2016, compared to 12 in the 2011 survey. Thus, programs are, on average, receiving more applications than 5 years ago for the same number of positions in their program.
- Most programs acknowledge that the number of students in their program remained relatively constant over the past 5 years, with few noting an increase or decrease of more than 10%. Programs noted that the major factors dictating the number of students they target for their program are the availability of funding and mentors for the students.
- Women represented 57% of the applicants, 58% of the students admitted, and 53% of those who began graduate training in the neural sciences in Academic Year 2016–2017. Compared to the previous two surveys, conducted in 2011 and 2009, the percentage of female applicants has increased from 51%, but the percentage of women beginning graduate training has remained constant.
- Applicants who identified as members of U.S. racial and ethnic minority groups represented 17% of applicants, 22% of those admitted, and 17% of those matriculated; each of these values has increased approximately 5 percentage points from the 2011 survey.
- Students who are non-U.S. citizens represented 27% of applicants but only 13% of those admitted and 15% of those matriculated.
- Acceptance rates for women were equal to the overall acceptance rate (19%) for US PhD programs. The acceptance rate for minority students was higher (22%) than the overall acceptance rate, while the acceptance rate for non-US citizens was lower (13%) than the overall acceptance rate.
- Applicants to US doctoral programs in neuroscience or a related-discipline came from a variety of undergraduate majors, though for the first time shown in these surveys, more than 20% of students majored in neuroscience at the undergraduate level. Nearly all incoming students had prior research experience, with the majority of applicants coming from Research 1 universities. Many students did not enter graduate school directly upon completing their undergraduate degree; programs reported the average time since previous degree for entering students as 1.7 years.

Training in US Doctoral Programs

- The average time to PhD degree was 5.6 years, a number that has been stable during the past decade. Programs report an average degree completion rate of 85%.
- A variety of curricular components are similar across doctoral programs; nearly all require laboratory rotations and formal coursework in responsible conduct of research and statistical methods. In contrast, only half the programs require coursework in experimental design, grant writing, or public speaking, and few have requirements in computer programming, data science, or science advocacy.
- Approximately 90% of PhD programs guarantee students a stipend, with the average program stipend being \$28,400 in 2016. Of note, this average stipend is approximately 20% higher than the 2016 NIH stipend rate for pre-doctoral students of \$23,376.
- On average, approximately three-quarters of the trainees who finished each program moved immediately to a post-doctoral training position, a number similar to recent surveys. However, there was a large variability across programs; for some programs there was a 100% rate of transition to post-doctoral training, whereas for others less than 50% of the students went immediately on to post-doctoral training.

- Approximately a third of programs acknowledge having made changes to their curriculum during the past 5 years based on the employment placements of their graduates.

Diversity in US Doctoral Programs

- Women make up more than 50% of the pre-doctoral student population and 50% of the postdoctoral trainee population, but only 30% of the faculty population.
- Underrepresented minorities make up approximately 20% of the graduate student and postdoctoral trainee populations, but only 10% of the faculty population.

US Master's Degree Programs

- This is the first time that the survey has asked specifically about Master's degree programs. Similar to PhD programs, most Master's programs are not departmentally based, but rather are interdepartmental.
- Of the 16 Master's programs that responded to this survey, more than one-third were established within the last 5 years.
- Not all Master's programs were thesis-based, although the majority (approximately 75%) were.
- Course requirements appear to be similar for PhD and Master's degree programs.
- Only approximately one-quarter of Master's programs reported that their degree recipients pursue another scientific degree after completion of the Master's, which suggests that Master's programs are not a pipeline to PhD programs. Rather, it appears that students with Master's degrees tend to be employed in the biotech or pharmaceutical industries, at scientific non-profit organizations, or in hospital or government settings after degree completion.

Undergraduate Programs

- Twenty-two US undergraduate programs responded to the survey, which was not enough to provide a comprehensive picture of undergraduate neuroscience training.
- Unlike the graduate training programs, which tend to have large faculty sizes, approximately 60% of the responding undergraduate programs had 15 or fewer faculty members.

Postdoctoral Training

- Programs were asked about postdoctoral training, and 66 institutions responded. Of these responding programs, 83% indicated that they offer postdoctoral training opportunities, and the majority of these institutions have an office dedicated to postdoctoral training.

Training Programs Outside the US

- Few training programs from outside the US responded to this survey, and so detailed data are not provided in the survey report.
- From the limited data available in this survey, it is clear that differences exist between training programs within the US versus outside the US. Future surveys will take this into account and will be designed to further explore differences in neuroscience training programs worldwide.

Conclusions

During the more than 30 years that a survey of neuroscience departments and programs has been conducted, there have been substantial changes in training programs in neuroscience, though the past decade has been notably more stable as the discipline and doctoral training programs have matured. Neuroscience training programs at the graduate and undergraduate levels exist in a great diversity of

sizes and administrative structures, and the stability reflected in the surveys conducted over the past decade indicates that these various structures can all be successful. While there are clear indications that neuroscience is a thriving discipline, the survey results show that significant challenges remain. Among them are issues related to underrepresentation of women and minorities as faculty members and in the discipline; the changing job market for neuroscience trainees; and how to best train students for the opportunities that will be available to them. It will be important to closely track these issues in the future via surveys that are best designed to assess the evolving nature of neuroscience higher education and training.